Acceleration

How to calculate, what position verse time graphs and velocity verse time graphs look like for an acceleration

DSHS physical science

Acceleration (a): Rate at which velocity changes each second.

Acceleration occurs both when velocity increases (speeds up) or decreases (slows down)

A. $$a = \frac{\Delta v}{t} = \frac{v_f - v_i}{t}$$

B. Units: $\frac{\text{meters}}{\frac{\text{second}}{\text{second}}}$ or (m/s^2)

An object accelerates anytime…..

- SPEEDS UP $v_f > v_i$
- SLOWS DOWN $v_i > v_f$
- CHANGES DIRECTION

Acceleration Practice Problems

Show your work, include all units, and highlight your answers.

1. A car begins at rest and rolls down a hill and reaches a velocity of 95 m/s after 60 s. What is the car's acceleration?

GIVEN VARIABLES	EQUATION	WORK / PICTURE	ANSWER

2. A bird begins at 1 m/s and slows to 0 m/s in 8 s. What is the bird's acceleration?

GIVEN VARIABLES	EQUATION	WORK / PICTURE	ANSWER

3. The wind is moving at 26 m/s and suddenly gusts to 38 m/s over 1 s. What is the wind's acceleration?

GIVEN VARIABLES	EQUATION	WORK / PICTURE	ANSWER

4. A bus has an acceleration of 12 m/s^2. If the bus's final velocity after 5 s is 35 m/s, what was the bus's initial velocity?

GIVEN VARIABLES	EQUATION	WORK / PICTURE	ANSWER

5. A truck has an acceleration of 23 m/s^2. If the truck's initial velocity is 2 m/s, what is the truck's final velocity after 10 seconds?

GIVEN VARIABLES	EQUATION	WORK / PICTURE	ANSWER

On a position versus time graph:

Zero slope means ---- _____

Steeper slope means ---- _____

More Shallow Slope means ---- _____

Positive Slope (above the x axis) means --- _____

Negative Slope (above the x axis) means --- _____

On a velocity verse time graph:

Zero slope at y=0 means ---- _____

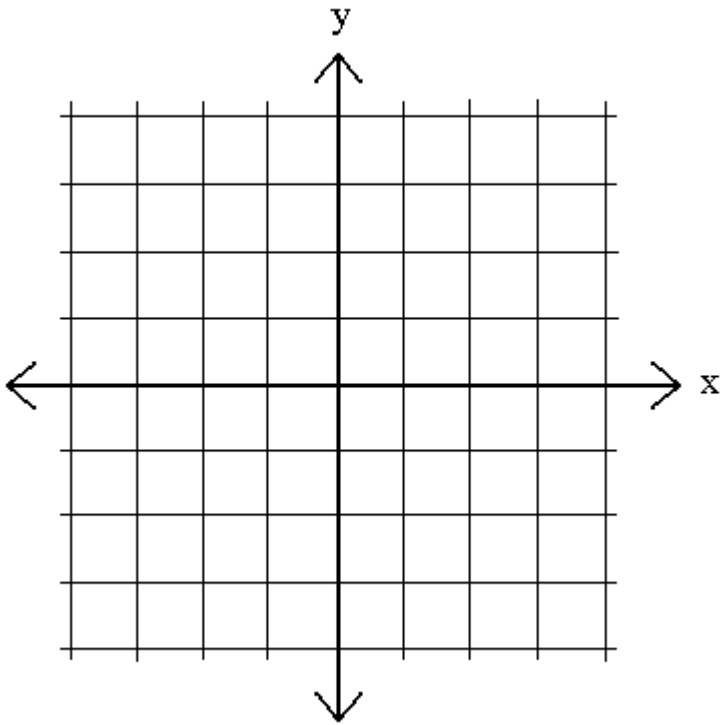
Zero slope at positive y value means ---- _____

Zero slope at negative y value means ---- _____

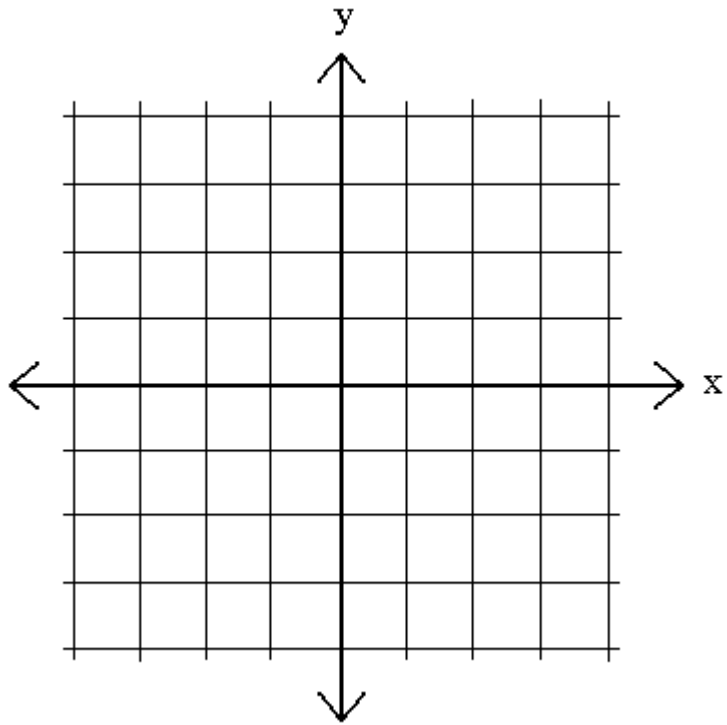
Positive Slope (above the x axis) means --- _____

Negative Slope (above the x axis) means --- _____

An object at REST
Position vs Time graph

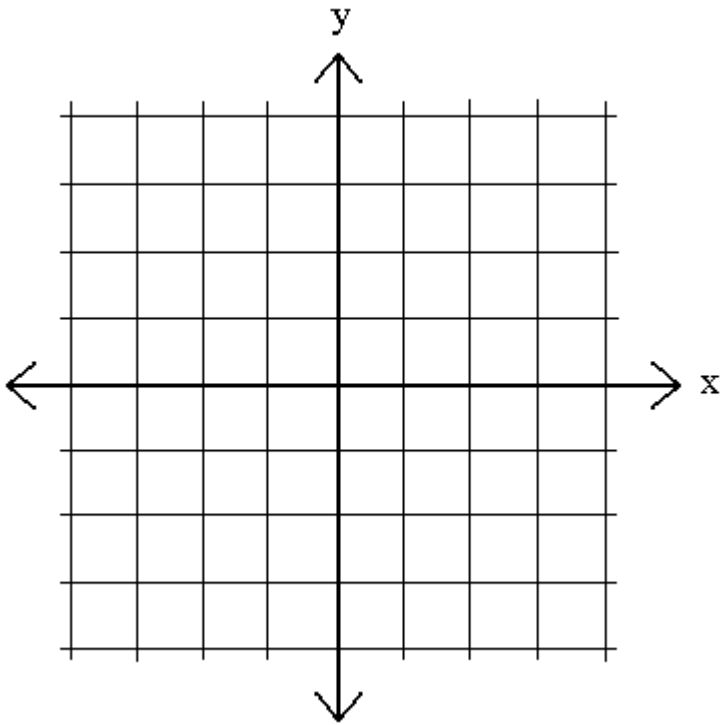


Velocity vs Time graph

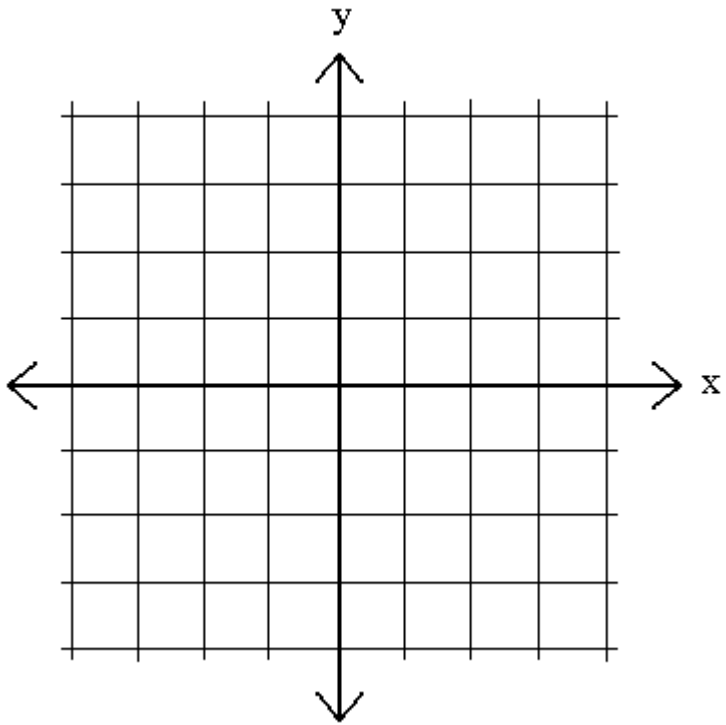


An object at moving at a CONSTANT POSITIVE VELOCITY

Position vs Time graph

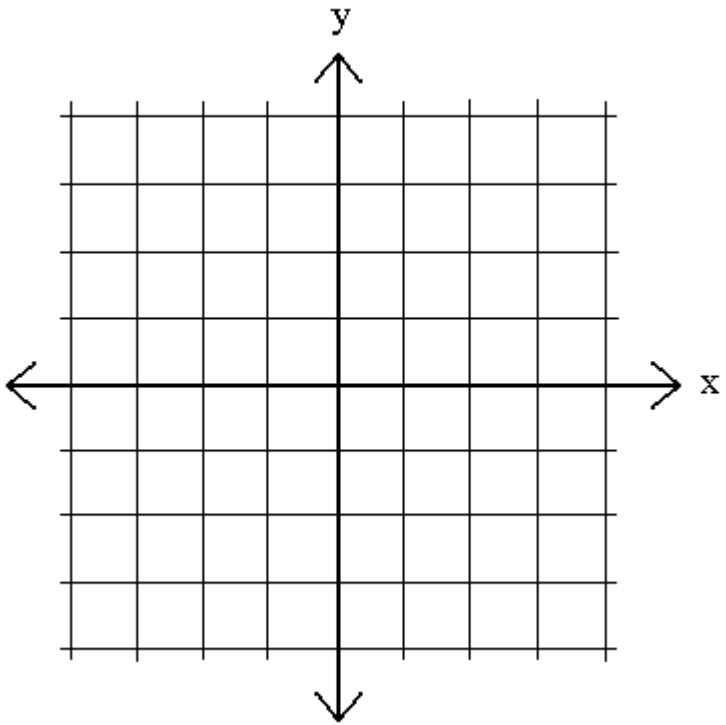


Velocity vs Time graph

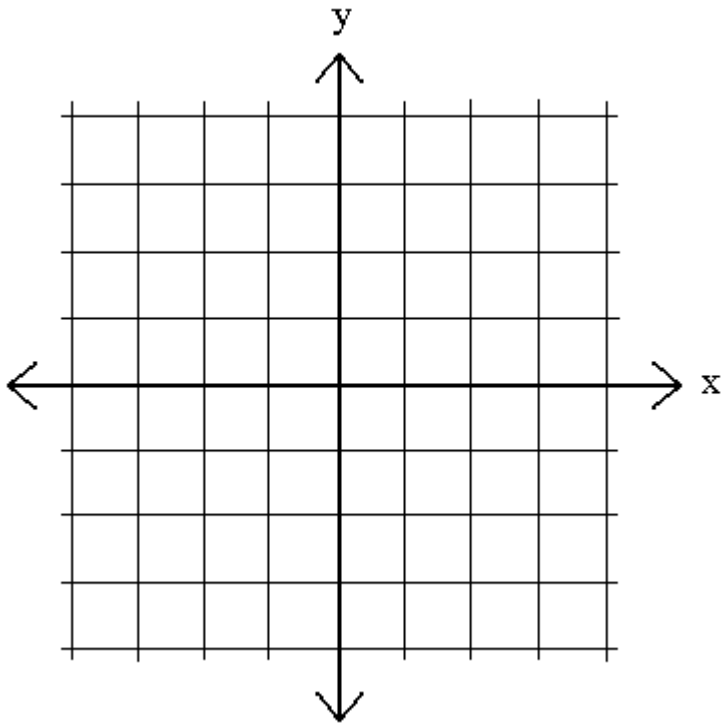


An object moving at a NEGATIVE CONSTANT VELOCITY

Position vs Time graph

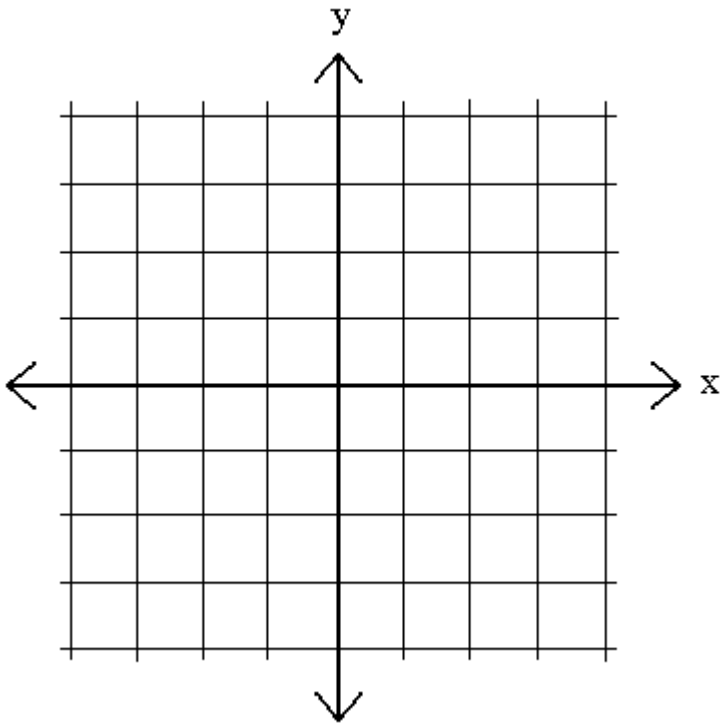


Velocity vs Time graph

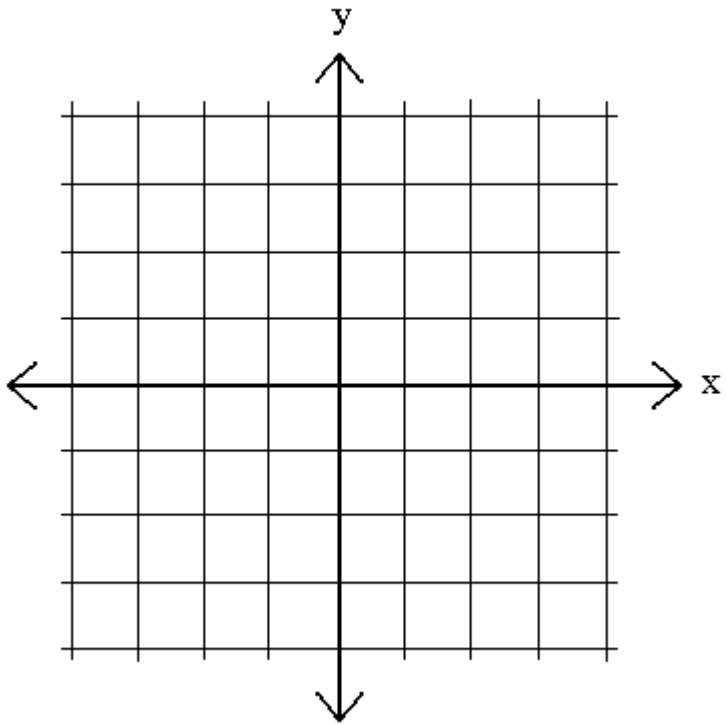


An object SPEEDING UP - INCREASING POSITIVE VELOCITY

Position vs Time graph

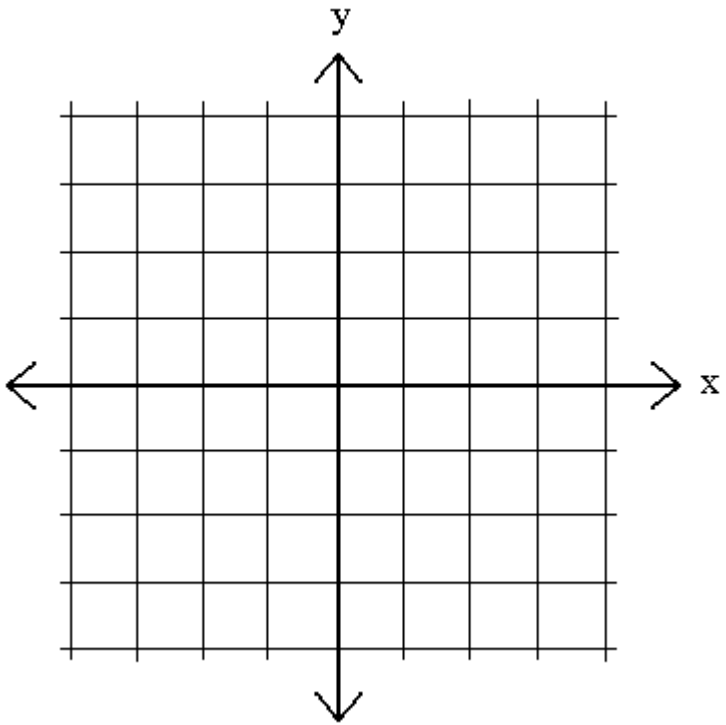


Velocity vs Time graph



An object at SLOWING DOWN - DECREASING POSITIVE VELOCITY

Position vs Time graph



Velocity vs Time graph